

*Appln no. 10/668,410  
Amendment dated Oct. 12, 2005  
Response to Office Action of July 12, 2005*

### **REMARKS**

Applicant has amended claims 1 and 9 and added new claims 17 and 18. No additional claim fees are needed.

Claims 1-6, 8-14 and 16-18 are pending. Reconsideration of this application, as amended, is requested.

### **The Claims, Generally, As Amended**

The presently claimed invention is directed to abrasive articles, in particular, structured abrasive articles. The abrasive articles include a plurality of protruding units, the units extending in at least two dimensions. Each protruding unit has a base defined by a periphery. Distal to the base, each unit has a distal region, which when projected on to a plane that is coplanar with its respective base, falls within the base periphery. Between this distal region and a center point of the base is an offset vector. The sum of the offset vectors for the plurality of protruding units is not zero. The protruding units may be provided on a backing. New dependent claims recite that all the offset vectors are the same; see, for example, FIG. 5 of the application.

### **Section 103 Rejection**

Claims 1-6, 8-14 and 16 were rejected under 35 U.S.C. 103(a) as obvious over Hoopman (U.S. Patent No. 5,672,097). The Office Action relies on the same reasons as set forth in the previous Office Action (of October 20, 2004). Applicant continues to respectfully disagree with this rejection.

Applicant has amended the claims to clarify that the sum of the offset vectors is not zero, more specific than having the sum of the offset vectors not approach a limit of zero.

Hoopman has been discussed in detailed in the Responses of April 12, 2005 and April 14, 2005; those arguments are not repeated herein, but continue to apply.

Hoopman does not discuss that the distal region of each of the protruding units can be offset, so that the sum of the vectors of the offset does not approach zero. In FIG. 8 of Hoopman, it is seen that the offset of the distal regions is random. Although not specifically shown in FIG. 8 or explicitly discussed in Hoopman, because it is random, the sum of the offset

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vectors in such a configuration is expected to be zero. In the pending claims, the sum specifically is not zero.

The amended claims of the pending application now recite that "the offset vectors for the plurality of protruding units do not exhibit a sum of zero" (see claim 1, lines 10-11; claim 9, lines 11-12). There is no discussion in Hoopman of having the sum of the offset vectors not be zero, nor is there a suggestion that it should not be zero. Hoopman focuses on random offset, with varying angles of intersection. Hoopman does not recognize the benefits, which were discovered by Applicants, of having an offset vector sum that is not zero, much less, of having all the offset vectors being the same.

As can be seen in the Declaration of Scott Culler submitted April 12, 2005 and again April 14, 2005, after 5 test cycles, Example D1 (which had the offset not summed to zero) performed 28% better than Comparative Example D2 (which was the Hoopman construction), and after 10 test cycles, Example D1 performed 41% better than Comparative Example D2. These results show that (after the initial period where the peaks of the protrusions are dulled) the abrasive protrusions that have offset vector not summed to zero, produce a better performance than those of Hoopman. Referring to the graph provided in the Declaration, it is seen that the difference in the performance between the example according to the invention and the comparative example increases over time of use.

Taking the teachings of Hoopman to have random offset peaks and different angles of intersection, it would not have been obvious to one skilled in the art of structured abrasives to create a structured abrasive having the offset peaks not summing to zero. Much less, it would not have been obvious to make a structured abrasive having all the offset peaks the same. Hoopman teaches high cut rate with fine finish with his structure, however, based on the test data provided by Mr. Culler, offset peaks with a sum of zero outperform Hoopman's constructions.

Applicant contends that the pending claims are patentable over Hoopman, and request that the rejection be withdrawn.

#### **Double Patenting Rejection**

Claims 1-6, 8-14 and 16 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of co-pending application no. 10/668,799.

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Although Applicant does not acquiesce to this double patenting rejection, to facilitate issuance of a patent from this application, Applicant will submit a terminal disclaimer to obviate the double patenting rejection, when the claims of this application have been indicated to be otherwise allowable.

Summary

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone Applicant's attorney Dan Biesterveld, Reg. No. 45,898, at 651.737.3193.

Respectfully submitted,

Date:

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